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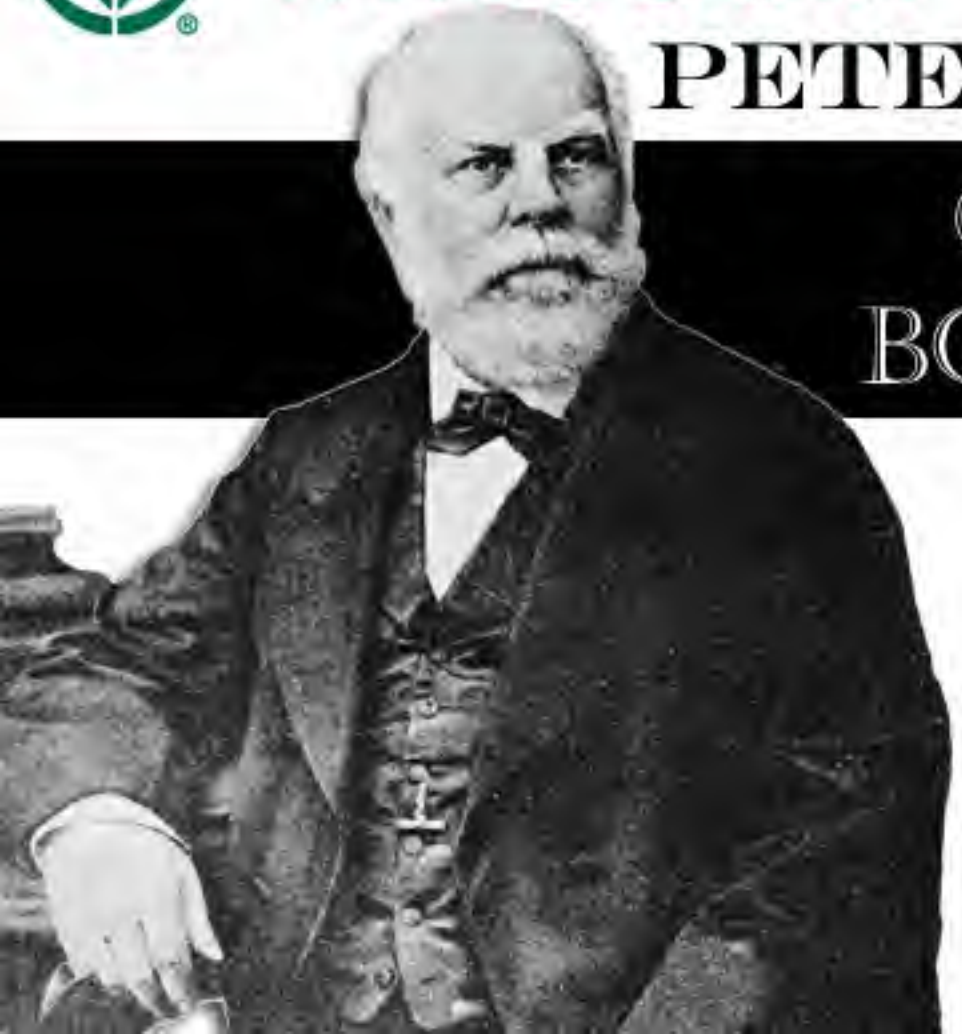

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Capt Wheeler's Expedition, Botany 1878 Ea 210

branches prostrate, running 10–20 feet." Segments of the upper leaves 2–4″ wide and 3′ long; lower leaves wider and shorter, somewhat lobed. Corolla yellow, 3′ long, funnel-shaped.—Arizona (441). Fruit 3′ in diameter, green, with white, longitudinal stripes.

CACTEÆ.

By Dr. George Engelmann.

Mamillaria (Coryphantha) vivipara, Haworth, Engelm. in Watson's Bot. King's Expl. 117.—A common plant on the Western plains from the Missouri to Texas, extending in the mountain regions as far west as Arizona and South Utah, the large, deep rose-colored or purple flowers, with fringed sepals and lance-linear, acuminate petals, green, oval berries, with light brown, pitted seeds, readily distinguish the species. The form of the plains is lower and often densely cespitose-spreading; the mountain plant is often simple and larger. The largest form, which comes from Arizona, I had at one time distinguished as *M. Arizonica*, but must now consider it as only a gigantic *vivipara*, 3–5′ high, 4′ in diameter, with spines often over 1′ long on rather broad and spreading tubercles. Rothrock, 1874, (203), is a smaller form, from Camp Apache, Ariz.

Mamillaria (Coryphantha) chlorantha, n. sp.—Similar to the last, but with broader yellow petals; stems oval to cylindrical, 3′ wide, sometimes 8–9′ high; tubercles compressed from above; 20–25 outer spines gray, almost in 2 series; 6–8 or 9 inner ones stouter, ½–1′ long, reddish or brownish only at the tip; flowers yellowish or greenish-yellow, crowded on the top of the plant, 1½′ long and wide, often 1–2 small, fringed sepals on the ovary (which also occasionally is seen in *vivipara*); sepals lanceolate, fringed; petals lanceolate or linear-lanceolate, acute, denticulate; 7–9 whitish stigmas, erect-spreading.—Southern Utah, east of Saint George, Dr. Parry. I. E. Johnson.

Echinocactus Wislizeni, Engelm.—Very large, often over 3° high and half as much in diameter; at first globose, then ovate to cylindrical,

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and many-seeded. Seeds ovate or oblong. Stems annual, roots perennial, often procumbent and rooting. Leaves cordate at base and lobed. Tendrils 2–many-cleft. Flowers large, yellow. Fruit often very large.—Bentham & Hooker.

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with 21–25 rather sharp ribs; the large linear-oblong areolæ (very woolly when young) bear three kinds of spines, first, 4 very stout, annulated, reddish ones, $1\frac{1}{2}$–$2\frac{1}{2}'$ long, the 3 upper ones straight, the lower one hooked; second, 3–5 lower and usually 3 uppermost spines, slender, but straight, stiff, and annulated, of reddish color; third, 12–20 whitish, bristle-like, flexuous, lateral spines: flowers 2–$2\frac{1}{2}'$ long, $1\frac{1}{2}$ wide, yellow, outside greenish with purple-brown; ovary and fruit imbricately covered with numerous (50–60) cordate or reniform crenulate sepals; sepals of tube oblong, ciliate; petals broadly linear, crenate, bristle-pointed; style deeply divided into 12–18 linear stigmas; seeds 1″ long or over, reticulate or shallow-pitted.—Southern New Mexico.

Var. Le Contei. (*E. Le Contei*, Engelm.)—At last clavate from a slender base; lower central spine more flattened, curved or twisted, but not hooked; flower rather smaller and with fewer parts.—This is the Western form, from South Utah and Arizona to and beyond the Colorado River. Dr. Rothrock collected, at Camp Bowie, Ariz., a peculiar form (492), which may represent another variety, *decipiens:* globose, 1° in diameter; spines shorter and fewer, no straight spines above the 4 central ones, none longer than 1–$1\frac{1}{2}$ inches; 10–15 thin flexuous spines on side and upper end of areolæ; only 20–25 sepals on ovary.

Echinocactus polycephalus, Engelm. & Bigel. (see Watson in Bot. King's Expl.117).—From the Mojave region to Southwestern Utah. The numerous spiny-bristly sepals, and the linear, acute, yellow petals almost hidden in a dense cottony wool.

Echinocactus Whipplei, Engelm. & Bigel; Watson, *l. c.* 116.—On the Lower Colorado River and northward into Utah.

Cereus (Echinocereus) Engelmanni, Parry; Watson, *l. c.* 117.—Throughout Arizona and into Utah and Southern California. Flower purple, open only in mid-day sunshine.—Camp Bowie (1002), Mrs. Major Sumner. Flower only. May be this or an allied species.

Cereus (Echinocereus) phœniceus, Engelm.—Globose or oval heads, 2–3′ high, about 2′ in diameter, several to a great many (sometimes over 100) from one base, 8–11-ribbed; 8–15 slender, but straight, stiff, and very brittle spines in each bunch, $\frac{1}{2}$–$1\frac{1}{2}'$ long, 1–3 of them more central and

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a little stouter; deep red flowers, $1\frac{1}{2}$–$2\frac{1}{2}'$ long, half as wide, open equally day and night, spatulate, rather stiff petals, rounded at tip.—From West Texas to Southern Colorado and Arizona, as far west as the San Francisco Mountains, Bigelow, and from Fort Whipple, Palmer.

CEREUS (ECHINOCEREUS) TRIGLOCHIDIATUS, Engelm.—Few (2–5) globose or oval heads, 2–4′ high, 2–$2\frac{1}{2}$ thick, 6–7-ribbed; areolæ more distant than in the last; spines fewer, only 3–6, flattened or angular, usually curved, about 1′ long; flowers same as in last.—New Mexico, Santa Fé, 1874, Rothrock (39). *C. gonacanthus*, Engel. & Bigel., which extends from New Mexico to the Arkansas River and westward to Zuñi, and is characterized by its stouter, longer, and more numerous spines, may belong to this species; and perhaps both, with numerous other so-called species, which vary only in the number of the ribs, the number or form of the spines, and the closeness of the spine-bunches, but have all similar flowers, may have to be considered as forms of one polymorphous type (*C. phœniceus*).

OPUNTIA (PLATOPUNTIA) BASILARIS, Engelm. & Bigel.—A low plant, with broadly obovate, often retuse or fan-shaped joints, branching mostly from the base, pubescent, as well as the fruit; areolæ very close, without spines, but densely covered with short, yellowish-brown bristles; flowers large, rose-purple; fruit dry, subglobose, with rather few, large and thick seeds.—Southeastern California to Arizona. Distinct from all other species of this region by its mode of growth, its pubescence, the absence of spines proper, and the very large ($3\frac{1}{2}$–5″ wide) seeds. The large purple flowers, which in the season completely cover the plant, make a beautiful show.

OPUNTIA (PLATOPUNTIA) MISSOURIENSIS, DC.—Santa Fé, N. Mex., 1874, Rothrock (6). Common from the plains of the Missouri into the mountains. A low, very spiny (whence Nuttall's name, *O. ferox*) species, with yellow or sometimes (on the Upper Arkansas plains) purple flowers, and dry spiny pods, which contain large, much compressed, and broadly margined seeds.—Several more, probably half a dozen, flat-jointed *Opuntiæ* have been noticed in Arizona, some prostrate and with smaller joints; others tall, erect, with large joints (to a foot or more in length), many of them very spiny; of them not much is known, as the plants are difficult

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to preserve and flowers and fruit have not often been found or collected. Full notes, living joints, good fruit and seed, and pressed flowers are desirable, to make us sufficiently acquainted with these plants. The best method of preserving the flowers is to split them open before attempting to dry them. Living plants or joints are very valuable, but alone are not sufficient, because in cultivation they very rarely flower and scarcely ever bear fruit.

OPUNTIA (CYLINDROPUNTIA) CLAVATA, Engelm.—A low, cespitose plant, with short (1–3′ high, 1′ thick), clavate, ascending, strongly tuberculate joints, the upper areolæ bearing 4–7 ebony-white, flattened, striate spines, surrounded by a number of smaller, bristly ones; yellow flowers, 2′ wide; dry, yellow, oval pod, covered with numerous, large, woolly, and long-bristled areolæ.—El Rito, New Mexico, Rothrock, in 1874 (92). Also about Santa Fé, etc.

OPUNTIA (CYLINDROPUNTIA) PULCHELLA, Engelm. (see Watson's Bot. King's Expl. 119; Simpson's Report, Botany, t. 3).—A very small, purple-flowered species of Nevada. A flower brought home by Mr. Bischoff was, by a singular error, enumerated in the Catalogue of 1874 as *Cereus viridiflorus*.

OPUNTIA (CYLINDROPUNTIA) ARBORESCENS, Engelm. (see Watson, *l. c.* 120).—Cuero, New Mexico (101), Rothrock, in 1874; Cienega, South Arizona (near Tucson), the same (584); and from Camp Bowie, Ariz. (1002), by Mrs. Major Sumner. This handsome species extends northward to the plains of Colorado and Pike's Peak, covering extensive tracts. Remarkable for its horizontal, often whorled, branches; purple flowers, 2–2½′ in diameter; ovary often with some spiny bristles, which at maturity disappear. The skeleton, as the cactus wood is rather fancifully called after the soft tissues have rotted away, forms a heavy, hollow cylinder, with regular rhombic holes or meshes corresponding to the tubercles and spine-bunches of the plant, and makes excellent canes. This species is closely allied to the Mexican *O. imbricata* and *O. decipiens*, *arborescens* being the northern, larger-flowered form, but the seeds are different.

OPUNTIA (CYLINDROPUNTIA) BIGELOVII, Engelm. (Pac. R. R. Rep. 4,

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Bot. 50, t. 19).—An erect, bushy plant, 10–12° high, with oval or subcylindric joints, bearing on short oval tubercles 3–5 large (1′ long) and many smaller spines, the larger ones loosely covered by glistening, whitish sheaths; purple flowers, small, 1 inch wide; fleshy, greenish berry, numerous small and very irregular seeds, or often abortive; wood a wide, fragile tube with short meshes.

Opuntia (Cylindropuntia) tessellata, Engelm.—Very bushy, from a stout trunk, with solid wood, sometimes several inches thick; ultimate branches as thick as a swan's quill, covered with angular, flattened, ashy-gray tubercles, the uppermost bearing at their upper end single, long, loosely yellow-sheathed spines; flowers small (about $\frac{3}{4}$ of an inch wide), yellow; small fruit, oval, covered with long, soft, brown bristles. Pac. R. Rep. *l. c.* t. 21.—On both sides of the Lower Colorado River, 6–7° high; the yellow, shining spines, crowded on the upper end of each year's growth, together with the scale-like tubercles, give the plant a singular and striking appearance.

There are several other cylindric *Opuntiæ* in Arizona, not collected in these Expeditions, and for the most part only imperfectly known. It is desired to direct attention to this interesting group, which, on account of the bulky forms and forbidding armament, are too much shunned by travellers.—*Opuntia echinocarpa*, Engelm. & Bigel., is a low and very spiny bush, with yellowish flowers and dry, spiny fruit. *Opuntia acanthocarpa*, Engelm. & Bigel, is taller, with elongated tubercles, or rather ridges, copper-colored flowers, and dry fruit bearing few, but stouter spines. *O. mamillata*, Schott, and *fulgida*, Engelm. & Bigel., are allied to *O. Bigelovii*, with thick tubercles or prominent crests, the former with small, the other with numerous long and shining, sheathed spines; fruit often abortive. Good specimens with flower, fruit, and good seed of the same plant (so that mixing species and forms may be avoided) are very desirable, as we know scarcely anything more about them than what the botanists of the Mexican Boundary Commission (often at the most unfavorable season) could find out, twenty-five years ago. *Opuntia leptocaulis*, DC. (*O. frutescens*, Engelm.), the most slender *Opuntia* known, bushy, with branches like pipe-stems, small yellow flowers, and red, somewhat fleshy berries, is common

from North Mexico, through Texas, to Arizona. It has been said that its flowers, contrary to the habit of the genus (which has diurnal flowers—*i. e.*, open in sunlight), are nocturnal, which, however, is now positively denied.

FICOIDEÆ.*

MOLLUGO VERTICILLATA, L.—Point of Mountains, Arizona (723).

UMBELLIFERÆ.

ERYNGIUM WRIGHTII, Gray (Pl. Wright. 1, p. 78).—Erect, smooth, pale, somewhat branched; lower leaves narrowly spatulate, regularly pectinate or toothed, with each tooth terminating in a bristle; stem-leaves lanceolate, 3–5′ long, deeply cleft, with the divisions terminating in a bristle; upper leaves shorter, more deeply and palmately parted; petals blue, with a long, inflexed point; leaflets of the involucre longer than the head; inner bracts slightly exceeding the flowers.—Sanoita Valley, Arizona (603), at 6,500 feet altitude.

MUSENIUM† TRACHYSPERMUM, Nutt.—Branching from the base; radical leaves ascending, petioled, pinnately parted, with the segments pinnatifid; rachis broad, 1–2″; fruit nearly as broad as long, and slightly roughened; involucel of 8–10 leaflets, 2–4″ long, narrow, but slightly dilated upward.—Colorado (726).

CICUTA MACULATA, L.—Nevada and Utah.

CARUM GAIRDNERI, Benth. & Hook.—Nevada, where, as in Utah, the tubers are an important article of food with the Indians.

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*FICOIDEÆ.—"A miscellaneous group, chiefly of fleshy or succulent plants, with mostly opposite leaves and no stipules; differing from *Caryophyllaceæ* and *Portulacaceæ* by having distinct partitions to the ovary and capsule (which are therefore 2–many-celled); the petals and stamens sometimes numerous in the manner of *Cactaceæ* (but the former wanting in most of the genera); agreeing with all these orders in the campylotropous or amphitropous seeds; the slender embryo curved partly or completely round a mealy albumen."—Fl. Cal. p. 250.

†MUSENIUM, Nutt.—Calyx-teeth conspicuous. Petals clawed, obovate, point inflexed. Stylopodia small, depressed, styles rather short. Fruit ovate, slightly compressed on the side, commissure rather broad; carpels 5-angled, a little compressed on the back, with the primary ribs filiform, rather prominent, lateral ones contiguous. Vittæ many. Carpophore bifid. Seed compressed a little on the back, with the sides a little incurved.—Perennial, cæspitose herbs, branching from the base, smooth. Leaves pinnate or bipinnatifid, segments pinnatifid. Many-rayed umbel compound. Involucre none. Involucel of a few short leaflets. Flowers white or yellow.—BENTHAM & HOOKER.

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